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ABSTRACT

This report describes a case study conducted to determine the way two elementary schools implemented the study skills element of the Wisconsin Design for Reading Skills Development and to assess the program results. Following a description of the Wisconsin Design and its study skills element, the report outlines the design of the case study; describes preliminary inservice teacher training, program planning, forming of skill groups, instructional activities, and procedures for testing students and recording scores; and reports the program results with regard to pupil performance, teachers' strategies, and students' and teachers' attitudes. It then presents guidelines for implementing the Wisconsin Design study skills element. An appendix lists skills and objectives for the study skills element for seven sequential levels, which roughly correspond to the levels kindergarten through grade six. The skills listed include those involved in alphabetizing and organizing information and using maps, graphs, tables, and reference materials. (GW)

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Technical Report No. 422

THE STUDY SKILLS ELEMENT OF THE WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT: A CASE STUDY

by

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Report from the Project on
Conditions of School Learning
and Instructional Strategies

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I

INTRODUCTION

PURPOSE

The reading project staff at the Wisconsin Research and Development Center (R & D Center) has recognized that schools initially implementing the Study Skills element of the Wisconsin Design for Reading Skill Development (Design) have a number of questions regarding the most effective procedures for carrying out the testing, instruction management and aspects of the overall program. Many prospective users express the desire to visit schools where implementation of study skills has already taken place. Because the means for such visitation and direct contact is frequently not available to school personnel, the project staff conducted a case study to report what happened in two schools implementing the Wisconsin Design Study Skills element for the first time. This report describes the school staffs, the students, the teaching, testing, and management procedures used, and the testing results after one year of implementation. The intent of this case study is to provide guidelines, in addition to the ones in the Teacher's Planning Guide: Study Skills (Askov & Otto, 1971), which can be generalized to various school settings to facilitate implementation. A brief overview of the Design and a summary of the development of the Study Skills element is also provided.

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

The Wisconsin Design is an objective-based system that can provide both structure and substance for an elementary school reading program, kindergarten through grade six. The focus is on developing the essential subskills of reading based on the assumption that if children acquire and apply the subskills they will be able to succeed in reading. Reports from the field support the assumption.

For teachers, the major contribution of the Design is that it helps them to systematize and to focus their teaching of reading skills. Each skill included in the Design is elaborated by a specific objective; the objectives, in turn, serve as the basis for the assessment of the skill development and for individualized instruction. Materials and procedures for keeping records and for implementing the system are also provided as components of the Design.

The main components--skills and objectives, assessment materials, instructional resources, and management materials--are described in more detail below.

Skills and Objectives. The skills selected as essential for success in reading are designated in an "Outline of Reading Skills" (see Appendix A in Otto & Askov, 1977). Based on input from successful teachers, research results, and common sense analyses of the reading tasks of elementary school pupils, the outline is a scope and sequence description of an elementary school reading program. The skills are grouped into six main areas: I. Word Attack skills; II. Study Skills; III. Comprehension skills; IV. Self-directed Reading skills; V. Interpretive Reading skills; and VI. Creative Reading skills. Each area is subdivided into levels that correspond roughly to grade levels as shown below.

ORGANIZATION OF THE OUTLINE OF READING SKILLS

Area	Grade/Skill Level						
	K	1	2	3	4	5	6
Word Attack skills	A	B	C	D	-	-	-
Study Skills	A	B	C	D	E	F	G
Comprehension skills	A	B	C	D	E	F	G
Self-directed Reading skills		A-C			D-E		F-G
Interpretive Reading skills		A-C			D-E		F-G
Creative Reading skills		A-C			D-E		F-G

A terminal objective has been stated for each skill area and an instructional objective has been developed for each skill in the Outline. (See Appendix B in Otto & Askov, 1977 for the instructional objectives. See also the Teacher's Planning Guide for each area for the terminal objectives and

for the instructional objectives.) The terminal objective for an area sets expectations as to the outcome once all of the instructional objectives have been covered. Thus, the terminal objective for the Study Skills element calls for using study skills independently to locate and derive information from a variety of standard reference sources as well as from maps, graphs, and tables.

An instructional objective--which either prescribes or describes expected behavior--has been developed for each skill identified in the Design. There are behavioral, or prescriptive, objectives for the Word Attack, Study Skills, and Comprehension areas; and there are expressive, or descriptive, objectives for the Self-directed, Interpretive, and Creative Reading areas.

The prescriptive objectives specify what a child is to do after having attained mastery of the skill. The expressive objectives are quite different in that they are mainly descriptions of activities that are judged to be relevant to the development of skills in the Self-directed, Interpretive, and Creative Reading areas.

Assessment Materials. Criterion-referenced assessment devices have been developed for all of the behavioral objectives of the Design. That is, using the behavioral objective as the description of criterion, or mastery, performance for each skill, both formal and informal assessment procedures have been worked out and made available.

Formal assessment is done with paper-and-pencil tests called the Wisconsin Tests for Reading Skill Development. There is a test for each objective in the Word Attack, Study Skills, and Comprehension areas. The tests are available in two parallel forms and in one of two formats--single sheet for a single objective or booklet for all the objectives at a given level. They can be group administered and easily scored by hand. Typically, the booklets are used for break-in testing in order to find an individual's instructional level; the single-sheet tests are used after skill instruction to assess the individual's attainment of criterion performance. Each test includes about fifteen items. The goal of the developers was to make them as brief as possible and yet attain a reliability coefficient of 0.80 or better and be assured of covering the behavior described in the objective.

In the Self-directed, Interpretive, and Creative Reading areas there are, of course, no criterion-referenced assessment exercises. Teachers are urged to observe pupils' performance in the activities related to each skill and to keep systematic records of exposure to and participation in the activities.

Instructional Resources. The Design does not include instructional materials per se. Because sufficient materials for teaching most of the essential skills are already available, the Design includes a component called the Teacher's Resource File, which amounts to a means for organizing existing materials and activities.

There is a Teacher's Resource File for the skill areas with behavioral objectives: Word Attack, Study Skills, and Comprehension. Within each file, materials and activities are identified and organized by objective. Thus, in each of the files there is a collection of materials and activities appropriate for teaching/learning the criterion behavior(s) prescribed by each objective. Of course, the files available from the publisher include only a limited sample or "starter set" of appropriate resources related to each objective. Teachers are invited to add whatever local resources they judge to be relevant to the objectives and to the needs of their pupils.

There is a single Teacher's Resource File for the Self-directed, Interpretive, and Creative Reading areas. Its organization is generally similar to that of the files for the other areas, with a specific file for each skill. The main difference is that the material related to each skill is organized to provide breadth of exposure rather than mastery of prescribed criterion behaviors.

Management Materials. Three components of the Design are directed specifically to providing assistance with its management and implementation. The Rationale and Guidelines (Otto & Askov, 1977) covers all six skill areas of the Design and provides a rationale for the development of the Design and guidelines for its implementation. There is a Teacher's Planning Guide for each skill area, with a separate book for Word Attack, for Study Skills, and for Comprehension and a single combined book for Self-directed, Interpretive, and Creative Reading. The planning guides include the specific information teachers need to get on with the implementation of an objective-based approach to each skill area. Taken together the Rationale and Guidelines and the teacher's planning guides provide the practical assistance that will enable a school staff to plan and carry out the assessment, grouping, scheduling, and record keeping that is required for successful implementation.

A final component is the Pupil Profile Card. Cards are provided for keeping a current record of each individual pupil's skill development in each skill area. Thus, when an individual's profile card is current for any given area--say,

Study Skills--it provides information as to which objectives the individual has and has not attained at that time. (See the respective teacher's planning guide for a more comprehensive discussion of the profile cards and how they are used.)

DEVELOPMENT OF THE STUDY SKILLS ELEMENT

In order to identify important study skills, that is, the skills that permit elementary students to independently use maps, graphs and tables, and reference sources, the reading project staff searched the scope and sequence statements in public school curriculum guides, standardized tests, content area texts (social studies, math, science, and language arts), and the related professional literature. The results of this search are summarized in a report published by the Wisconsin R & D Center (Otto, Kamm, & Weible, 1972). To summarize through the early 1960's, the study skills received little attention from either researchers, teachers, or publishers of commercial materials. A few lists of skills had been compiled but no basis on which to organize the skills had been established and teachers were basically unaware of the need for these skills. The project staff examined the available materials and then identified the important skills, arranged them sequentially, and wrote a behavioral objective for each skill. The general list of skills was subdivided into three major subareas--maps, graphs and tables, and references--and then into strands and substrands of related skills (see Figure 1). Within each strand clusters of skills were arranged according to Design Levels A-G. These levels roughly correspond to the traditional grade levels K-6 (see the list of skills and objectives in Appendix). A criterion-referenced test was developed for each skill and model instructional materials were developed. Evaluation of the Study Skills element started about one year after initial implementation and included three basic steps: a pilot (Quilling & Wojtal, 1972), a small scale field test (Sals & Hubbard, 1975), and a large scale field test (R & D Center, 1974). The pilot test involved an intensive study of the program's feasability in three schools. The small scale field test involved more schools than the pilot and minimal implementation assistance. The last phase, the large scale field test, was conducted in several hundred schools which had no interaction with the R & D Center except for a three-day introductory workshop.

The results indicated that an important gap in the elementary curriculum had been filled--essential skills which had previously been only "picked up" were now part of a

systematic attempt to focus instruction. The primary fault of the Study Skills program concerned the great number of skills, which could not be effectively managed in the classroom. Also, some skills were too detailed--such that instruction in one brought about mastery in another. On the basis of the data from this preliminary version, many refinements were made. The modified skills and objectives constituted the commercial version of Study Skills which is the one currently available and the one evaluated in this study. [See the Teacher's Planning Guide: Study Skills (Askov & Otto, 1971) for a more complete description of the skills and objectives.]

II

DESIGN OF THE CASE STUDY

The case study was conducted for one year in two Wisconsin schools. It included (1) school-wide break-in testing with the Wisconsin Tests for Reading Skill Development: Study Skills (WTRSD:SS); (2) an end-of-the-year check on pupil records to determine the number of skills gained over the school year; (3) administration of a pre- and post-instruction standardized test; and (4) monthly visits to the schools by a member of the reading project staff (project monitor). Since the main purpose of the study was to determine how the schools proceeded independently with implementation, all of the responsibilities for testing and carrying out instruction were assumed by the teachers.

Although the teachers had the freedom to fully adapt the Design to their local needs, the project monitor strongly recommended that basic implementation procedures (e.g., forming groups for skill instruction) suggested in the Teacher's Planning Guide: Study Skills be followed. The results of the case study are more easily interpreted by other school personnel if the basic guidelines are followed. In addition, the project staff was interested in evaluating the effectiveness of the implementation steps recommended in the planning guide.

GOALS

The project staff listed four main reasons for conducting the case study. They included learning about (1) pupil performance during one school year with regard to the Design Study Skills behavioral objectives; (2) the relationship between students' performance on the Design criterion-referenced tests and on standardized tests; (3) how implementation steps were carried out, e.g., how instructional skill groups were formed, resource files managed, and skills taught; and (4) change in teachers' and students' attitudes.

DESCRIPTION OF THE SCHOOLS

In planning the study the project staff stipulated that the schools selected meet two conditions: each school should have had (1) at least one year's experience in Word Attack implementation, and (2) no previous experience with the Design Study Skills element. In addition, the schools had to be within a reasonable driving distance from the R & D Center so monthly monitoring efforts and frequent exchange of materials could be easily handled. A brief description of the two schools, School X and School Y, follows.

School X. School X is located in a rural section of central Wisconsin. The students are white and primarily from farming families. The elementary school building includes two classes each of grades K-5. Each class has about 23 students. The middle school includes grades 6-8, although only the sixth graders participated in the study. The 75 sixth graders are divided into three classes of about 25 students each.

In the elementary school building there are 12 regular classroom teachers, two reading teachers (one half-time supervisor), one special education teacher, two instructional aides (each only one-half day per week), and one clerical aide (one-half day per week). The middle school is departmentalized and includes ten teachers for grades 6, 7, and 8. There is a half-time supervisory reading teacher, one special education teacher, and one half-time clerical aide. Both buildings are traditionally organized with individual classrooms and no movable walls. The additional rooms are a library, combination speech and teachers' preparation room, and teachers' lounge.

School Y. School Y is located in southeastern Wisconsin. Although the area is rural, the population is more typically suburban since most of the families work in larger cities near by. School Y has two classes each of grades K-6, with an average of 26 students per class. There are 13 regular classroom teachers, one reading specialist, and one three-quarter time instructional aide. The school building is traditionally organized with individual classrooms and no movable walls. It includes a library and a teachers' lounge as additional rooms.

III

ASPECTS OF IMPLEMENTATION

The various aspects of implementation are described in terms of the following procedures: preliminary training (including inservice sessions and keying of local materials to the objectives), skill instruction, selecting teaching materials, forming skill groups, testing, recording scores, and planning. These procedures were observed daily by the reading specialist, designated "coordinator," in each school, and once a month by the project monitor. Through discussions with the teachers, the coordinator identified the particular strategies they were using to carry out the implementation procedures. These strategies varied in degree of effectiveness and, frequently, the coordinator and project monitor worked with the teachers to try different strategies in hopes of achieving as smooth an implementation as possible.

PRELIMINARY TRAINING

Before the beginning of school in the fall, the coordinators each arranged a one and one-half day inservice session at the school. It was held in conjunction with the normally-held four-day pre-school inservice session which had been shortened to accommodate the teachers' work with the Design Study Skills element. The project monitor conducted both workshops and focused on three main topics: (1) helping the teachers see how the Design fits into their daily curricula, (2) examining the Study Skills element in detail, and (3) keying commercially published materials to the Study Skills objectives.

To help the teachers view the Design with perspective and to better understand the role the Design should play in their total reading program, the project monitor discussed possible ways both for adapting the Design to different school settings and for incorporating the different elements of the Design (Word Attack, Study Skills, Comprehension, and Self-directed, Interpretive, and Creative Reading) into an ongoing curriculum. This discussion was followed by a careful review

of the tests and manuals and implementation procedures recommended in the teacher's planning guide. Differences between the Study Skills and Word Attack elements were pointed out.

On the second morning of the inservice session the project monitor provided an opportunity for the teachers to key their local materials to Study Skill objectives. The purpose of keying these materials is to acquaint teachers with (1) the Study Skills objectives, and (2) additional materials--their own and others in the school--that can be readily used or adapted for skill instruction. The teachers in School X were enthusiastic and seemed to take full advantage of the time to work with the materials. The teachers in School Y did not share the same commitment and elected not to key in local materials. When they began instruction in their skill groups, therefore, they were completely dependent on the activities in the teacher's resource file. In fact, their instruction for the entire year consisted mainly of worksheets; they used few games or audio-visual materials.

PLANNING

The coordinator and the project monitor suggested the teachers begin specific planning for teaching their skill groups during the second week of school. In School X two different staffs (and buildings) were involved because the sixth graders were part of the junior high school. The elementary grade teachers decided to hold informal planning sessions, since they were all well acquainted, shared teaching beliefs and enjoyed working together. They kept each other informed through brief, daily meetings in the teachers' lounge and occasional (two per month) meetings after school. The coordinator played a major role in being sure each teacher carried out the implementation steps according to plan. For example, test scores were to be reported to the aide in charge and ideas and activities were to be added to the teacher's resource file. In the sixth grade the coordinator had to initiate planning sessions and perform some of the implementation steps--such as recording test scores and organizing the resource file, herself, since the teachers were unaccustomed to working together and skeptical of introducing a skills management system.

In School Y, one-half hour planning sessions were held either before or after school two times per week. The teachers met as a primary unit (grades K-3) and as an intermediate unit (grades 4-6). The coordinator met with the

groups and helped them work out solutions to such problems as how to coordinate individual schedules with other schedules and how to integrate skill instruction into the content areas.

To fit the Study Skills program into the curriculum, the teachers changed their instruction in the different subject areas to include skill development work as well as lessons in basic content. This idea worked whether the teachers were teaching the Study Skills program as an integral part of a subject area or in "isolation." For example, if map skills were being taught as part of social studies, then 30 minutes of the hour-long social studies period was devoted to map skill instruction and 30 minutes to content. If, on the other hand, instruction in map skills was given apart from the social studies period, then time for the map skill groups was simply "borrowed" from the social studies period. An example schedule might include map skills being taught from 10:30 to 11:00 a.m. and social studies content being taught for one half hour--1:00 to 1:30 p.m.--instead of the usual hour--from 1:00 to 2:00 p.m.

FORMING SKILL GROUPS

The teachers studied the results of the break-in testing and selected the skills to teach according to the students' needs. For example, if 15 students needed instruction in Skill 1 at Level C, then the teachers would form a skill group comprised of those 15 students and teach Skill C.1. In both schools the coordinators helped with forming groups by checking to see that the groups were as homogeneous as possible and that each student had been included in some type of meaningful activity (not necessarily a skill group). The basic grouping procedures used in each school are described in this section; specific information, such as the average size and number of skill groups, is presented in the Results section.

School X. Initially, the elementary teachers tried to teach in a self-contained situation. They abandoned the idea after one instructional period of three weeks, because they found that frequently the same skill was being taught in several rooms at the same time (so not enough instructional materials were available), and trying to individualize within one classroom was too formidable a task. The teachers changed their strategy by establishing a thirty-minute "study skills time" on four days of the week. Students were exchanged across classes and up to one grade level. They continued this procedure throughout the remainder of the year, although they varied (a) the length of the daily periods from 20 to 45

minutes, (b) the number of days per week the skills were taught from two to four, and (c) the instructional periods from two to three weeks. They always set aside one week between instructional periods to plan and regroup.

Additional ideas the teachers used in forming skill groups included alternating days for study skills and word attack skill instruction (too many skill groups in one day was confusing) and setting up an "overflow" class for students not involved in a skill group. One teacher was responsible for planning "worthwhile" activities for the overflow class. Another idea many teachers tried was to group related skills. Because they had found the instruction within any one strand (e.g., representation) was similar for skills at two or three levels, they taught these related skills together in one group. They felt this procedure was efficient in terms of teacher preparation time.

Responsibility for teaching the skills, themselves, was assigned differently in the two buildings. The junior high teachers each taught only one subarea of skills the entire year. The social studies teacher taught maps, the English and science teachers taught references, and the math teacher taught graphs and tables. The elementary teachers each taught a different subarea every two or three instructional periods.

School Y. During the fall semester most of the primary teachers grouped within their own classes. They usually held three twenty-minute sessions per week. Beginning in February, however, the teachers began to exchange many students across classes and some students across grades. They coordinated their schedules so the 20 minutes for study skills instruction occurred at the same time in the day. The staff generally felt that exchanging students was an efficient use of time.

In grades 4 and 5 the four teachers exchanged their pupils initially and continued this procedure for the entire year. They set aside a specific block of time for study skills and selected the skill(s) for instruction on the basis of the greatest need. In grades K-5 each teacher taught skills in all three subareas.

The two sixth grade teachers kept in touch with the ongoing skill activities in grades 4 and 5 and in some cases exchanged students. Basically, however, they did not cross-grade during the fall semester. The two teachers divided up their responsibilities for the content areas much the same as the sixth grade teachers had done in School X.

During the spring semester, however, they tried a more formalized approach to their grouping procedures by establishing a specific time (e.g., 1:00 p.m. each day) to teach skills. They also attempted more cross-grading with the fourth and fifth grade groups.

Kindergarten. The grouping procedures in kindergarten were similar in both schools. In spring 1974 all the kindergarten students were tested with Level A. These students began first grade in the fall at Level A (or at Level B, if they had been tested up). The new kindergarten group (fall 1974) did not participate in any testing until midyear (January 1975), when some of the average and above-average students were tested with Level A. The teachers began to form skill groups the second semester, but did so only within the kindergarten class. No students, for example, went to a first grade for skill instruction, even if they had progressed to Level B. By spring, most of the below-average students were also involved in at least one skill group. The teachers felt, in general, that the Level A skills were quite easy for the average and above-average students and that these skills could have been introduced in the fall.

The teachers in School X found opportunity to work with individual skill groups by setting up individual work stations. Only five to seven students attended any work station at one time. All but one or two of the stations had independent activities such as cutting, pasting, painting, and coloring, set up for the students to do. The teacher (and aide, if available) taught a specific skill with the other one or two groups of students. The activities lasted about 15 minutes. One of the teachers reported that having one or two fifth graders help out from time to time worked very well.

INSTRUCTION

To carry out skill instruction the teachers in both schools primarily followed the suggested activities in the teacher's resource file. The teachers in School X, however, did spend considerable time throughout the year adapting activities in their content area texts and putting together certain games for use with map skills in the primary grades. The intermediate teachers also put together some instructional packets, called contracts, which were designed to be used independently by students to develop the related skill(s). One contract was developed for each of the following reference skills: Level D, Skills 7, 9, 11, 12; Level E,

Skills 7, 8, 9, 10, 12, 13, 15. The teachers reported the contracts worked adequately, since all but a few students who completed them passed the appropriate posttests. Additional materials used in School X included several commercially prepared map skills materials (e.g., plastic inflatable globes, three-dimensional floor maps), which the teachers purchased for motivational purposes. Everyone enjoyed working with them and found they added variety.

Other instructional considerations, such as which skills were taught most and least and the amount of time spent teaching a skill, are discussed in the Results section.

TESTING

The study skills standardized tests, the Iowa Tests of Basic Skills (ITBS) (1971) subtests W-1 (Maps), W-2 (Graphs and Tables), and W-3 (References) were administered in the late spring of 1974 and 1975. All other testing was conducted with the WTRSD:SS according to the testing strategies recommended in the Teacher's Planning Guide: Study Skills.

Break-in and Retesting. The teachers administered the Wisconsin Design break-in tests in spring 1974. For purposes of the case study they administered the tests according to the students' grade levels and not according to the students' abilities, as is normally done. That is, instead of selecting levels above or below grade level for high ability and low ability students, the teachers gave all students in one grade the same level of tests. First graders took Level B, second graders took Level C, third graders took Level D, etc. This procedure called for retesting in the fall (to determine more suitable placement for the lower ability students), but yielded information about where students, without previous instruction, break into the program. This information is presented in the Results section and can be used by teachers as a guideline in selecting appropriate levels for their own break-in testing. Additional guidelines are presented in the Teacher's Planning Guide: Study Skills. Selecting appropriate break-in levels should be done carefully in order to minimize the amount of retesting.

The purpose of break-in testing is to determine each student's instructional level. The instructional level is the level at which a student can learn the skills with guidance from the teacher. If the skills are either too difficult or if they can be picked up independently, then that level is not considered the student's instructional

level. In such cases, the student should be retested down or up one level, respectively.

The criterion for deciding whether a level is appropriate is based on the number of skills the student masters at the break-in level. The following chart shows the criteria used in Schools X and Y.

Level	Total Number of Skills Tested*	Number of Skills Needed to Establish Instructional Level	Minimum Number of Skills Needed to be Tested Up
A	2	0	2
B	4	2	3
C	10	3	8
D	12	3	10
E	14	3	12
F	12	3	10
G	10	3	8

*The performance tests (administered individually) at Level C, D, and E were not assessed as part of this case study.

These criteria for establishing a student's instructional level differ only slightly from the recommendations in the Teacher's Planning Guide: Study Skills. The project staff felt that three skills, instead of just two, should be mastered before a student stayed at a level and was not retested down. Also, the minimum number of skills needed to be retested up is slightly less at the levels in which there are performance tests, since the performance tests (one at Level A, one at Level C, two at Level D, and three at Level E) were not administered. The teachers, basically, lacked confidence and did not want to be responsible for individual administrations while they were participating in the case study. They planned to teach those skills at a later point in implementation.

Posttesting. An overall posttest with the Wisconsin Tests was not needed in spring 1975 since the tests had been administered throughout the year and students' current skill attainment could be determined from their updated profile cards. Generally, the teachers gave the individual posttest

for a skill from one to three days after instruction in the skill. The idea behind delaying the posttest is to identify those students who have retained the skill over a period of several days. Students who do so are more likely to retain the skill for several months (or permanently, if it is periodically reinforced) than those who merely manage to pass a test upon completion of instruction. Students who perform at the 80 percent level or above immediately following instruction, but not after several days, probably need more opportunities for application of the skill. Students who did not master the posttest were recycled for instruction in that same skill at a later date. When students were instructed in a skill for the second time, the teachers tried to assign them to a different teacher and give them a different set of instructional materials.

In School Y several teachers digressed from the recommended procedures and conducted what seemed to be an excessive amount of testing. After the pupils' instructional levels had been determined, the teachers tested for the nonmastered skills again, before the students had had any opportunity for skill instruction. In some cases the teachers did find that a child who had not mastered a skill at break-in, did master the skill later--without the intervening instruction. One implication of this finding is that break-in and retesting results may be undependable if the tests are not given under optimum conditions (e.g., small enough groups or rest periods between the tests).

The main effect of the overtesting was the negative attitudes acquired by the students involved. They seemed to lose sight of the reason for working with the Design skills. In contrast, the other students not involved (both in School Y and in School X) had positive attitudes. The project monitor observed that much of the extra testing was done by the teachers who really were not instructing for specific skills, but merely doing additional testing to see whether any change in skill attainment had occurred. In the many cases where the results were not different from the break-in results, both the teachers' and children's time was wasted.

Pretesting. Most of the teachers, particularly in School X, were consistent in consulting the "Pretesting strategies" (Teacher's Planning Guide: Study Skills, p.26). When a student had completed a level of skills, they administered the appropriate tests at the next level to determine whether any skills had been mastered. The teachers reported that the time was well spent because this procedure eliminated unnecessary instruction at the next level.

RECORDING SCORES

The teachers recorded all test scores on their own mimeographed charts and then notched the appropriate holes on the profile cards (see Figure 2). A color-coding scheme was used on the cards so that skills mastered at break-in could be differentiated from skills mastered between October and February and those mastered between February and May.

In School X the teachers made an additional chart showing the progress of all students with regard to all Design Study Skills. This chart was used primarily by the teachers to ensure that no child was being either ignored completely or consistently left out of instruction in a certain subarea. At one point the teachers considered using this chart to convey information about a pupil's progress to parents. However, they quickly determined that this procedure was disastrous. Most parents became preoccupied with comparing their own child to other children instead of focusing on where their child had been and where he or she was going. Subsequently, the charts were moved permanently to the teachers' lounge and individual profile cards became the main vehicle for communication between parent and teacher.

The staff reported that these large colorful charts were worth the time and effort that went into making them because they provided a needed perspective and visible goals. Skill grouping was also easier since students' needs tended to stand out graphically.

In addition to recording the test scores on the profile cards, the teachers in both schools filled out a skill group card (see Figure 3) for every skill group formed. The teachers recorded pertinent information, such as the skill name, group size, grade(s), number of masters, length of group, and instructional materials used. These cards were the main basis for conveying results between the schools and the reading project.

IV

RESULTS

The results of the one-year implementation effort in the two schools are based on both formally and informally gathered information. The formally gathered information includes test scores (on instruments described in the testing section) and skill group card reports. The test scores yielded information about the pupils' study skill attainment and the skill group card reports summarized the teachers' skill grouping and instructional strategies (e.g., the average size and number of groups, amount of time spent teaching, and the skills taught most and least). The informally gathered information primarily concerns teachers' and students' beliefs and attitudes and was obtained through the project monitor's interviews with the teachers.

PUPIL PERFORMANCE

The results of the pupils' performance on the WTRSD:SS and on the ITBS are summarized in Tables 1-8. The scores are reported by school and grade.

Design Skills. In Tables 1 and 2 the mean number of Design skills and corresponding Design levels in 1974 and 1975 are shown for grades 1-6. Exact change in students' abilities can be seen by examining the mean number of Design skills for each group. General change can be observed by noting the instructional levels. Because there are many skills at the higher levels, a gain of only one instructional level can, in fact, reflect a gain of as many as 18 skills (grade 6, School X). For a more meaningful interpretation of the mean instructional levels, refer to Tables 1A and 2A, which show the actual distribution of the students in those two grades.

In general, the students at each grade level in both schools showed gains in Design skills. The gains were similar for grades 1-5, but the gain for grade 6 in School Y was minimal, while the grade 6 gain in School X was dramatic. One reason for the small gain in School Y may have been due to the

sixth grade teachers not formally teaching skills. They taught general skills--as they occurred in their texts--to heterogeneous groups rather than forming homogeneous skill groups and developing specific skills.

Students' Gains in Design Skills. After noting the mean gains, the project staff examined correlations between the students' skills in 1974 and 1975 and their overall gain to determine which students were, in fact, acquiring the skills. Three relationships are shown in Tables 3 and 4. The relationship between the skills in 1974 and the skills in 1975 for each of grades 1-6 was generally quite positive, meaning the students were relatively stable. Students with few skills in 1974 had few skills in 1975, and students with many skills in 1974 had many in 1975. First grade students in School Y were the only exception--no particular pattern was discernible for students beginning with either few or many skills. In Table 3A one of the sets of correlations is depicted graphically to provide a more meaningful interpretation. It shows the actual distribution of the students according to their beginning skills and amount of gain.

The second relationship, that between students' skills in 1974 and their overall gain, shows that those students in grade 6 in School X and in grades 1 and 2 in School Y who had many skills at the beginning gained very few skills over the year; and that students with few skills at the beginning, gained quite a few skills. These results may be due to a strong instructional focus on students with few skills and little focus on students with many skills. The students in the other grades (1-5 in School X; 3-6 in School Y) generally showed no particular pattern. Students beginning with high or low skills may have gained either few or many skills.

The third relationship, that between students' skills in 1975 and their overall gain, indicates that there were some students who, despite their gain of quite a few skills over the year, did not necessarily end up with relatively many skills. These students were mainly in grade 6 in School X and in grades 1, 2, 5, and 6 in School Y. (In the case of grade 6 in School X and grades 1 and 2 in School Y these findings reinforce those reported for the second relationship, that between students' skills in 1974 and their overall gain.) In the intermediate grades where there are many skills and a wider range in abilities, gaining a number of skills but not necessarily ending with many, is understandable. This situation, however, is difficult to understand in the primary grades. In all of the other grades (1-5 in School X; 3 and 4 in School Y) students who tended to gain many skills ended with many skills.

The main purpose for examining the relationships between students' skill attainment in 1974 and in 1975 and their overall gain is to show that students' gains can vary greatly between grades and certainly between schools. The predominant pattern showed that while individuals' relative skill attainment did not change greatly over a period of one year (i.e., students starting with low skill attainment ended low, and students with high skill attainment stayed high), the amount of gain was not necessarily predictable. For example, some of the students with low skill attainment in both 1974 and 1975 gained many skills and some gained only a few. Perhaps a more systematic approach to managing skill groups, such as setting goals or specifically planning the amount of skill instruction for each student, would help teachers project students' gains more accurately. While identifying all of the factors contributing to these results was not the purpose of this study, certainly two factors, teaching methods and management techniques used with the skill groups, should be considered to have great impact on the amount of learning that takes place.

ITBS and Design Skills. The results of the ITBS are presented in Tables 5 and 6. Generally, there was an average gain of at least one grade equivalent at each grade level. Since this case study was not a formal research endeavor, no control group existed with which to compare these test results. The teachers reported, however, that this type of gain had not occurred in other years in the study skills areas.

Correlations between the grade equivalent attained in subtests W-1, W-2, and W-3 and in numbers of Design skills were generally high in each grade in both schools, which indicates a positive relationship between the ITBS subtests W-1, W-2, and W-3 with the WTRSD:SS. In Tables 7 and 8 the general correspondence between these tests is shown to be very similar in both schools. The best generalization is that each Design instructional level (which is tied to a traditional grade level: A-K, B-1, C-2, D-3, E-4, F-5, G-6) corresponds with an ITBS grade equivalent score that is about two years below. That is, students obtaining grade equivalency scores between 4.0 and 4.9, 5.0 and 5.9, 6.0 and 6.9, 7.0 and 7.9 were usually placed at Design levels C, D, E, and F, respectively. Although this general correspondence is based on a fairly small number of students at each grade level, (N = grade 1, 104; grade 2, 70; grade 3, 95; grade 4, 102; grade 5, 89; grade 6, 127), it can serve as a guideline for teachers selecting appropriate Design level tests for their break-in testing. The ITBS grade equivalency scores should be used only as a guideline, however, since other factors, such as a teacher's judgment about students' abilities, may be just as reliable.

One observation pertinent to both schools is that none of the pretest (1974) mean grade equivalency scores for any of the grades was more than .3 below the expected grade equivalency score. Consequently, dramatic gain in the scores was not expected. The teachers were pleased with the one grade equivalent gain and the corresponding gain in Design skills. They planned to work over the next several years, however, to bring their students in each group up to the corresponding Design level, instead of having the students perform one and two levels below. Their reasons were based on their agreement that the Design skills are appropriately leveled and use of them is frequently required in the students' content area texts. In schools where results of the ITBS show students are below the expected grade equivalency scores, even more dramatic gains in ITBS scores might be obtained. Any change, however, would be contingent upon the degree and quality of implementation of the Study Skills element.

TEACHER'S STRATEGIES

The teachers' instructional and grouping strategies were evaluated on the basis of the information recorded on the skill group cards (Figure 2). The results of their strategies are discussed in terms of the number, average size, and length of the groups and the specific skills taught.

Number of Skill Groups. In Table 9 the number of skill groups formed during the year in each subarea is shown. For example, in School X five groups were formed to teach the Level A map skills. The numbers in brackets (3, 0, 0) indicate that there are a total of three map skills and no graph or table or reference skills at Level A. Several skill grouping trends are apparent in Table 9: (1) School X formed many more skill groups at the intermediate Levels E-G, than School Y; (2) School Y formed extremely few skill groups at Levels F and G; and (3) School X formed many more groups for Level E skills than any other level. One result of the second trend may have been the very minimal gain made by the sixth graders in School Y (Table 2). They made the least progress of any grade. The third trend may have occurred for two reasons: (1) intermediate students without previous instruction in the Study Skills element may not have picked up the Level E skills (as they might have the Levels A-D skills), and therefore, needed work at Level E before proceeding to Levels F and G; and (2) the teachers wrote contracts (see discussion of Instruction in the Implementation Strategies section) for seven of the Level E skills. Because the contracts were used independently by the students, the teachers were able to form many groups for those skills.

Skill Group Size and Mastery Rate. The average skill group size and number of masters per group for both schools is shown in Table 10. Although the groups ranged from one to thirty students, most of the groups, in fact, included about seven to twenty students. The teachers in Schools X and Y reported that help from the aides was invaluable in keeping the groups small. Each staff, however, had also set up an "overflow" group. Students who did not need the specific skills being taught in the groups were put into this overflow group instead of being left in one of the skill groups. Generally, the teachers and aides traded responsibility for the overflow students and saw to it that the students were assigned meaningful activities to do independently. Having the overflow group available meant that the teacher-pupil ratio in the skill groups could remain low.

The average number of masters per group is quite low (except for grade 1 in School Y). Hopefully, as implementation problems are worked out within a school, and as teachers become more familiar with the skills and more effective in their instruction, the mastery rate should go up.

Length of Skill Groups. Table 11 shows the number of times the groups met and the length of each session. Most of the groups met between four and six times, however, at School X a number of groups also met between seven and nine times and between ten and thirteen times. The groups that were held from one to three times were generally for students who had received earlier instruction in that skill.

The length of each meeting varied from fifteen to forty-five minutes. In School X over half of the groups were held for forty to forty-five minutes, while most of the remaining groups met for twenty-five to thirty minutes. In School Y most of the groups met for either fifteen to twenty minutes or twenty-five to thirty minutes. The shorter sessions in School Y might be due to the fact that the majority of the skill groups were formed with primary-aged students. Overall, fifteen-minute sessions are not recommended (except in kindergarten), since instruction must be extremely well organized to be effective.

Specific Skills. After examining the grouping procedures used in the schools, the project staff questioned which of the seventy-one Design study skills had been taught during the year. In Table 12 the seventy-one skills are listed according to the numbers of groups formed for each one. For example, Skill 1 at Level E was taught in many groups (a total of ten) in both schools. Level E Skills 2-7, 9, 10, 13, and 15 were taught many times in School X, but very few times, if any, in School Y. Level E Skills 8, 11, 12, 14, 16, and 17 were taught

very few times, if any, in either school.

Table 12 is probably most helpful to teachers initially implementing the Study Skills element if it is used simply as a guideline to show the skills taught most and least in two schools. Students in other settings may well have other strengths and weaknesses. Teachers might specifically use Table 12, however, in their initial keying of materials into the teacher's resource file. They can note the skills in the first column which were taught most in both schools, and be sure those skill files, in particular, contain adequate instructional materials.

STUDENTS' AND TEACHERS' ATTITUDES

At the end of the year the project monitor talked informally with the teachers about their experiences in implementing study skills. The most dramatic changes took place in the junior high in School X. Typically, these teachers had worked independently and taught their subjects in a traditional manner with little focus on reading skill development. After working with their coordinator and being guided through the implementation steps for the eight months, most of them agreed about the benefits of teaching specific skills. They had enjoyed planning with the other teachers and felt they now worked much more as a team than as individuals. Their greatest reward was the change they saw in their students' attitudes. The students became genuinely interested in achieving their study skills, and discipline problems seemed to lessen during the skill group time. In the elementary building in School X the teachers also reported a positive change in students' attitudes. When the students understood the reason for the posttests, for example, they began to look forward to each opportunity to try to master another skill. The teachers' enthusiasm for study skills was based on their students' reactions, the different types of materials they were using, and the feeling of success they shared.

In School Y the teachers involved the students in additional testing, which resulted in negative attitudes. Later in the year, however, as different problems were settled, both the teachers' and students' attitudes mellowed, and the intermediate students, in particular, enjoyed the map and graph skills.

The coordinator felt that if better planning times were established during the school day, the teachers would be more likely to work together to reduce some of their preparation time. The net effect would be better organization, more effective grouping, and hopefully, better feelings about their skill instruction.

V

IMPLICATIONS FOR IMPLEMENTATION

The Wisconsin Design Study Skills element is adaptable to a variety of school settings and therefore no specific lists of dos and don'ts for implementation can or should be devised. Based on the results of this study, however, general recommendations are made with regard to certain strategies the teachers used to carry out the implementation steps. These recommendations, together with the previous discussions of the implementation strategies and results, form the basic implementation guidelines that are helpful to schools initially using the Study Skills element.

1. Preliminary Training--Becoming familiar with the study skills objectives and organization of the teacher's resource file prior to implementation is critical for all teachers. In School Y the staff seemed to get off on the wrong foot and never adequately prepared their instructional activities for the entire year. Because of a lack of preparation, the teachers used the teacher's resource file as their main teaching source, when, in fact, using a wide variety of materials would have been more appropriate. The students were unhappy doing lessons in which the style and content changed very little.

2. Planning--Frequent planning sessions, even if brief, are fundamental to good communication among staff members. After several planning sessions with the junior high teachers in School X, they began to take some initiative in identifying and solving their own problems. Designate one person (e.g., teacher, unit leader, reading specialist, librarian, principal) to coordinate implementation efforts, such as scheduling the inservice sessions, organizing the keying activities, ordering materials, encouraging communication among staff members, initiating planning sessions, and helping to juggle schedules. The coordinator is particularly important in situations where the teachers do not know each other or are reluctant to individualize their reading instruction. Specific weekly planning periods designed to emphasize the need for flexibility and to identify problems are essential.

3. Instruction--A variety of materials should be used, particularly with those students repeating instruction in a skill. Some materials should be designated for students' independent use, since teachers are then permitted more time to work with individuals in skill groups.

Ideally, the skills should be taught as part of a content area, or at least taught with content materials the students are currently using. For example, a chapter in a social studies text (perhaps one assigned for homework) can be used to teach an outlining skill. The sixth graders in School X looked forward to the days when specific map skills were included with the usual emphasis on content.

4. Testing--Break-in testing need be done only once. If the initial Design levels administered to students are selected carefully, little retesting should be necessary. Teachers should follow break-in testing (and retesting) with instruction, and ultimately, use pretesting strategies to eliminate unnecessary testing at the succeeding levels. Students may acquire negative attitudes if they see no purpose for the tests. Posttesting for each skill should be done several days after instruction is completed.

5. Recording Scores--Updating the profile cards at least every two or three weeks is important for keeping track of each student's progress and for being able to share that information with other teachers and parents. Many teachers stressed that other larger, color-coded charts showing a whole class gave a helpful perspective on how a particular group of students was progressing.

6. Evaluation--This procedure was primarily carried out by the project staff, but the teachers expressed several ideas:

a. If they had been better prepared at the start, their implementation procedures might have smoothed out much earlier. They cautioned that irreparable harm can come from beginning too soon or the wrong way.

b. It was difficult to give each student equal instructional opportunities. When forming the skill groups, teachers were unsure about which students had the most significant needs and how these needs could best be met. One suggestion was to spend more time at the beginning setting goals for individual students, such as, "John S. (in the fourth grade) should complete Level C by mid-year." During the first part of the year, then, John's teacher would know that it is appropriate for him to complete Level C, and she need not worry about getting

him through Levels D and E at that time. The idea is that the teacher keeps track of the students individual goals rather than try to compare the number of hours he or she spends with each pupil.

c. The Design skills are relevant to the students' daily reading tasks. Even though the ITBS results indicated many students were already at grade level in their skill attainment, many of these students could not perform, independently, the tasks required in their content texts. The teachers, therefore, intended to improve the students' abilities so that, ultimately, each student would be working at a Design level corresponding to his or her grade level. Currently, many students were working at a Design level about two years below their grade level.

d. Strong leadership and support from the person in charge (principal or reading coordinator) is essential. The individual must have a thorough knowledge and understanding of the Design and be creative.

e. Parent involvement is important. In Schools X and Y parents and even superintendents were leary at first of any management system. Sending out letters of explanation and invitations to learn more about the Design, however, helped lessen apprehension. In School X many parents actually became enthusiastic about teachers' goals to individualize reading instruction.

f. An end-of-the-year evaluation session including everyone involved in implementation would be a good way to begin planning for the next year.

SUMMARY

To begin implementation of the Wisconsin Design Study Skills element, the school staff should be familiar with the general steps and recommendations in the Teacher's Planning Guide: Study Skills. When teachers are knowledgeable about the basic procedures, the recommendations in this report can be used as guidelines for identifying specific strategies to carry out the assessment, management, instruction and evaluation steps.

REFERENCES

1. Evaluation--Wisconsin Design for Reading Skill Development: Study skills Type II field test, 9/71-5/73. Madison: Wisconsin Research and Development Center for Cognitive Learning, October 1974.

2. Askov, E., & Otto, W. The Wisconsin Design for Reading Skill Development: Teacher's planning guide-Study skills. Minneapolis, Minnesota: National Computer Systems, 1971.

3. Iowa Tests of Basic Skills. Houghton Mifflin Company, 1971.

4. Otto, W., & Askov, E. Wisconsin Design for Reading Skill Development: Rationale and guidelines. Minneapolis, Minnesota: National Computer Systems, 1977.

5. Otto, W., Kamm, K., & Weible, E. Wisconsin Design for Reading Skill Development: Rationale and objectives for the Study Skills element. Working Paper No. 84. Madison: Wisconsin Research and Development Center for Cognitive Learning, 1972.

6. Quilling, M. R., & Wojtal, P. The Wisconsin Design for Reading Skill Development: Study skills-A report on the pilot test: 1970-72. Working Paper No. 97. Madison: Wisconsin Research and Development Center for Cognitive Learning, 1972.

7. Sals, D., & Hubbard, W. D. The Wisconsin Design for Reading Skill Development: Study skills-A report on the Type I field test, 1971-73. Technical Report No. 341. Madison: Wisconsin Research and Development Center for Cognitive Learning, 1975.

APPENDIX

SKILLS AND OBJECTIVES FOR THE STUDY SKILLS ELEMENT

Level A

1. Representation: Arranges models(1i)

   Objective: The child reproduces an arrangement of objects in his environment through the use of three-dimensional models (e.g., the child places blocks on a floor map to reproduce the actual arrangement of houses in his neighborhood).

2. Orientation: Describes relative positions of objects(2)

   Objective: The child describes the positions of objects and representations of objects in relation to other objects and representations with the terms *right-left, up-down, on, between, near (beside), behind-in front of (back-front),* and *below-above (under-over).*

3. Measurement: Describes relative sizes(3)

   Objective: The child uses the descriptive terms *bigger-smaller, taller-shorter,* and *higher-lower* to compare sizes of objects and representations of objects.

Level B

1. Representation: Uses picture symbols to interpret maps(1)

   Objective: The child uses realistic pictures (e.g.,) to derive information from maps.

2. Orientation: Locates points on simple picture grids(2)

   Objective: The child uses coordinates to locate points and to describe the locations of points on picture grids.

3. Measurement: Determines relative distances(3)

   Objective: The child uses descriptive terms such as *closer-farther, long way-short way* to compare distances between representations of objects as they are arranged in sandbox models, pictures, or maps.

4. Graphs: Compares amounts(4)

   Objective: The child uses descriptive terms (i.e., *most, fewest* or *least, more fewer,* or *less, largest, smallest,* rather than exact numbers to express comparisons of amounts on picture, bar, and circle graphs.

Level C

1. Representation

   a. Uses a key containing nonpictorial symbols to interpret maps(1)

      Objective: The child uses a key containing nonpictorial symbols (e.g., lines, dots) to derive information from maps.

   b. Uses a color key to interpret maps(2)

      Objective: The child uses a color key in which distinct colors identify classes, and no more than three shades of any color identify subclasses, to derive information from maps (e.g., the child reports that there are two areas with sugar maple trees [light blue] and one area with silver maple trees [dark blue]).

2. Orientation: Locates points on number-letter grids(3)

   Objective: The child uses coordinates to locate points and to describe the locations of points on number-letter grids.

3. Measurement

   a. Compares sizes(4)

      Objective: The child interprets symbols that depict relative sizes of areas (e.g., lakes, parks, forests) on maps.

   b. Expresses relative distances(5)

      Objective: The child uses familiar nonstandard units of measurement (e.g., city blocks, houses) to express distances and comparisons of distance on maps.

4. Graphs

   a. Extracts directly(6)

      Objective: The child notes the number of units represented by a whole symbol and then computes the total number of units in a particular row on a picture graph, and notes the line to which a particular bar comes and reads the number beside the line on a bar graph.

   b. Determines differences between numbers extracted(7)

      Objective: The child compares, by adding or subtracting, the exact amount represented by given bars on a simple bar graph.

5. Tables

   a. Compares amounts(8)

      Objective: The child uses descriptive terms (e.g., *most, fewest* or *least, more, fewer* or *less, largest, smallest)* to compare quantities in cells on tables with five or fewer rows and columns.

   b. Locates cells(9)

      Objective: On tables with five or fewer rows and columns the child finds the point of intersection of a specified row and a specified column and derives information from it.

6. Utilization: Develops book skills(10i)

   Objective: The child

   - locates and knows the purposes of the title page, table of contents, and index of a book
   - finds the title and author's name on the title page.

7. Location: Applies basic alphabetizing skills(11)

   Objective: The child alphabetizes words by attending to the first and second letters.

Level D

1. Representation: Uses point and line symbols to interpret maps(1)

   Objective: The child uses point and line symbols to derive qualitative and quantitative information from maps (e.g., the child identifies the largest city on a map as the one represented by the largest circle).

2. Orientation: Indicates cardinal directions on globes(2)

   Objective: The child indicates on a globe

   - north and south with reference to the North Pole, South Pole, and equator
   - east and west with reference to the Prime Meridian.

3. Measurement: Uses scale to determine whole units of distance(3)

   Objective: The child uses a scale bar referent $\left(\frac{0 \qquad 1}{\text{miles}}\right)$ or verbal referent (1 inch = X units) to determine and compare distances between points

- one or more referent units apart when one referent unit equals one standard unit of measure (e.g., 1 inch = 1 mile)

- one referent unit apart when one referent unit equals more than one standard unit of measure (e.g., 1 inch = 20 miles).

4. Graphs

   a. Determines differences between numbers extracted(4)

      Objective: The child compares, by adding or subtracting, the exact amounts represented by whole symbols in given rows on a picture graph and pairs of numbers extracted directly from a simple line graph.

   b. Extracts by interpolating(5)

      Objective: The child determines approximate amounts on picture graphs with whole and partial symbols and on bar or line graphs with bars or dots representing numbers that fall between those marked on the axis.

5. Tables: Determines relationships between cells(6)

   Objective: The child determines, by adding or subtracting, the difference between two specified cells on a table with five or more rows and columns, totals for each row and column, and familiar units for denominate numbers.

6. Utilization

   a. Begins to use indexes(7)

      Objective: Having identified a general topic, the child uses the indexes of books to locate information about the topic.

   b. Has beginning dictionary and glossary skills(81)

      Objective: The child

      - locates, finds words in, and demonstrates his knowledge of the purpose of a glossary

      - recognizes similarities and differences between a glossary and a dictionary

      - uses a dictionary to check the spelling of words as needed.

c. Uses tables of contents[9]

Objective: The child refers to the table of contents

- to determine if a book is relevant to his specific purpose
- to locate a particular chapter or section in a book.

7. Location

a. Applies alphabetizing skills[10]

Objective: The child alphabetizes words by attending to all the letters.

b. Uses guide words in simple reference books[11]

Objective: The child locates the appropriate alphabetical section of a reference book for a given topic or target word by attending to the alphabetic sequence of guide words.

8. Organization and evaluation

a. Uses headings and subheadings[12]

Objective: Given a general topic in a reference book, the child decides which heading or subheading is most appropriate for locating specific information.

b. Selects relevant sources[13]

Objective: Given several topics, the child chooses from among a list of available sources those that are likely to include relevant information on the topics.

c. Recognizes printed statements may be fact or opinion[14]

Objective: The child determines whether given statements represent fact or opinion.

Level E

1. Representation: Uses point, line, and area symbols[1]

Objective: The child uses point, line, and area symbols to derive qualitative and quantitative information from maps.

2. Orientation: Determines intermediate directions on globes, in the environment, and on maps[2]

   Objective: The child

   - determines intermediate directions when describing the relative locations of two points on globes, in his environment, and on maps
   - relates the locations of points on globes and maps to the locations of points in the environment e.g., the child matches objects shown on a map with objects in his environment to determine direction).

3. Measurement: Makes limited use of scale to determine distances[3]

   Objective: The child uses a scale bar referent ($\frac{0 \quad 1}{\text{miles}}$) or verbal referent (1 inch = X units) to determine and compare distances between points one or more referent units apart when one referent unit equals two or more standard units of measure (e.g., when 1 inch = 3 miles, the child concludes that 3 inches = 9 miles).

4. Graphs

   a. Determines differences between numbers extracted[4]

      Objective: The child compares, by adding or subtracting, the amounts represented by bars at or between the lines on a bar graph.

   b. Determines purposes and makes summary statements[5]

      Objective: On picture, circle, bar, or line graphs the child

      - surmises the objective of the presentation by considering all of the parts (e.g., the child determines from the title, dimensions, and nature of content that a graph shows the number of ships built in three countries during ten consecutive years)
      - summarizes all of the data presented (e.g., the child concludes from the graph in the above example that one country is the major source of production for one particular year, while another country is the major source of overall production).

5. Tables

   a. Determines relationships between cells[6]

      Objective: The child determines, by multiplying or dividing, the difference between two specified cells on all types of tables.

b. Determines purposes and makes summary statements[7]

Objective: On any table the child

- surmises the objective of the presentation by considering all of the parts (e.g., the child determines from the title, dimensions, and nature of content that a table shows the number of ships built in three countries during ten consecutive years)

- summarizes all of the data presented (e.g., the child concludes from the table in the above example that one country is the major source of production for one particular year, while another country is the major source of overall production).

6. Utilization

a. Refines use of indexes[8]

Objective: Given a general topic, the child uses the indexes of books or the index volume of an encyclopedia to locate information regarding specific topics (e.g., SPACE, Space travel: development of flight plan, history of).

b. Uses dictionaries independently[9]

Objective: The child uses a dictionary to check the meanings of words as needed.

c. Uses cross references[10]

Objective: The child

- locates a topic in response to a SEE reference (e.g., having located "Mohawk Indians. *See* Iroquois Indians," the child locates the topic)

- locates supplementary material in response to a SEE ALSO reference (e.g., having located the topic "Iroquois Indians," the child locates additional material in response to "See *also* Indian, American [Eastern Forests Indians]").

d. Uses a variety of sources[11]

Objective: The child

- adapts his utilization skills to the idiosyncrasies of format in atlases and sets of encyclopedias (e.g., he can locate a given topic in encyclopedias with individual volume indexes, no indexes, and multivolume indexes; he can locate specific maps in atlases)

- familiarizes himself with magazines and newspapers as sources of specialized and/or current information
- uses the vertical file.

7. Location

a. Uses guide words and guide letters[12]

Objective: Given guide words or letters, the child

- specifies the card catalog drawer in which specific words, names, or topics are found
- specifies the page on which specific words are found in a reference book.

b. Uses guide cards[13]

Objective: To locate information in the card catalog, the child

- uses guide cards in the drawers
- ignores initial articles in titles.

8. Organization and evaluation

a. Takes notes[14i]

Objective: The child

- takes notes from varied sources in a form that is useful to him in retrieving information
- identifies his sources in simple bibliographical form.

b. Selects specialized reference books[15]

Objective: The child selects the specialized reference book (e.g., *World Almanac* or *Information Please Almanac*, *Junior Book of Authors*, dictionaries, encyclopedias, atlases, and other specialized reference books) that is most likely to include the information for which he is looking.

c. Considers special features of books[16i]

Objective: The child

- examines books to judge their relevance to his purpose (e.g., the child considers whether the book includes relevant information by scanning locational and study aids as well as pertinent illustrations)

- consults the bibliography of a book to help locate other materials of interest.

d. Checks facts from two sources[17]

Objective: The child identifies discrepancies between simple factual data from two sources.

Note: When children identify these discrepancies through classroom research, they should be directed to discover *why* two sources provided different answers (e.g., is it their error in notetaking; is one source out of date; are the graphs, tables, etc., labeled differently?).

Level F

1. Representation: Analyzes maps of two or more areas to determine similarities and differences[1]

Objective: The child makes comparisons of geographic areas in terms of topographic, climatic, political, and demographic information provided on maps.

2. Orientation: Uses various projections[2]

Objective: The child locates the same point or cell on various projections (e.g., polar, Mercator).

3. Measurement

a. Uses inset maps to determine relative sizes of areas[3]

Objective: The child determines relative sizes of two or more areas drawn to different scales by comparing the inset maps which are all drawn to the same scale (e.g., the child determines that even though his maps of Rhode Island and Texas are the same size, Texas is indeed larger since the area of Texas outlined on an inset map of the U.S. is much larger than the area outlined for Rhode Island).

b. Compares maps drawn to different scales[4]

Objective: The child identifies differences (e.g., amount of detail) between maps of the same area drawn to different scales (e.g., 1 inch = 1000 miles, 1 inch = 100 miles, and 1 inch = 50 miles).

4. Graphs: Determines differences between numbers extracted[5]

Objective: The child compares

- pairs of numbers interpolated from a complex line graph by adding or subtracting

- pairs of numbers extracted directly or by interpolation from a complex bar graph or simple line graph by multiplying or dividing.

5. Tables: Determines relationships between cells on schedules[6]

   Objective: The child uses numbers and descriptive terms to report the relationships among cells (e.g., on a plane schedule the child notes that there are five more evening flights than afternoon flights between Baft Field and Clayville, but the earliest evening flight is not until 8:00 p.m.).

6. Utilization

   a. Uses *Subject Index*[7]

      Objective: The child uses *Subject Index to Children's Magazines* for locating materials in children's magazines.

   b. Uses dictionaries for pronunciation[8]

      Objective: The child uses the diacritical markings in a dictionary to interpret the pronunciation of unfamiliar words.

7. Location

   a. Applies card filing rules[9]

      Objective: The child locates target cards by applying these filing rules:

      - names beginning with either *Mac* or *Mc* are filed together as if all were spelled *m-a-c*
      - common abbreviated words (e.g., *Mr.*) are filed as if they were spelled out
      - numbers are filed as if they were spelled out.

   b. Uses Dewey Decimal System[10]

      Objective: In the library the child locates books according to specific subject areas within the ten major groupings of the Dewey Decimal System.

8. Organization and evaluation

   a. Has beginning outlining skills[11]

      Objective: Given the major points in a formal outline, the child selects and fills in second-order points from well-organized paragraphs written at his instructional level of difficulty (e.g., given the outline

I. Different kinds of birds are alike in many ways.

A.
B.
C.

II. A bird's feathers are useful.

A.
B.

and paragraphs about likenesses among different kinds of birds and usefulness of bird feathers, the child completes the outline).

b. Uses information on catalog cards to select material(12)

Objective: The child uses the information given on a catalog card (e.g., date of publication, publisher, number of illustrations, type of illustrations) to decide whether the book or other material is appropriate to his purpose.

Level G

1. Representation: Synthesizes information about an area(1)

Objective: The child uses a variety of maps of a given area to determine specific characteristics (e.g., using topographic, climatic, political, and demographic maps of a particular area, the child infers that since the area has average rainfall, gently rolling hills, and a moderate climate, the occupations of the inhabitants may be mostly farm-oriented).

2. Orientation

a. Uses latitude and longitude(2)

Objective: The child uses lines of latitude and longitude to locate points on a map or globe (e.g., the child notes that New York City is 40° north latitude and 74° west longitude).

b. Determines directions on any projection(3)

Objective: The child uses meridians and parallels to determine directions on any projection (e.g., on an elliptical projection with the Prime Meridian at the center, the child traces the meridian from a given point to the pole to show north or south).

3. Measurement: Makes use of scale to determine distances[4]

   Objective: The child uses a scale bar referent ($\frac{0 \quad 1}{\text{miles}}$) or verbal referent (1 inch = X units) to determine and compare distances between points that are combinations of fractional and whole referent units apart when one referent unit equals two or more standard units of measure (e.g., when 1 inch = 10 miles, the child concludes that 2 1/2 inches = 25 miles).

4. Graphs

   a. Determines differences between numbers extracted[5]

      Objective: The child compares, by multiplying or dividing, pairs of numbers extracted directly or by interpolation from complex bar or line graphs.

   b. Makes projections and relates information[6]

      Objective: The child states probable outcomes or trends on picture, bar, and line graphs (e.g., having observed a trend shown, the child predicts future performance) and relates the information presented and the projections derived to his previous knowledge.

5. Tables: Solves problems on schedules[7]

   Objective: Given any schedule, the child derives information from it to answer a specific travel problem (e.g., given a plane schedule and the circumstances that Mr. Jones must travel from Chicago to Los Angeles and back between 6 a.m. and 7 p.m., the child determines that Mr. Jones must leave on West Air flight #203 and return on flight #46).

6. Utilization: Uses *Readers' Guide*[8]

   Objective: The child uses *Abridged Readers' Guide to Periodical Literature* for locating material in general adult magazines.

7. Location: Uses card catalog to locate reference materials[9]

   Objective: In the library, the child

   - identifies author, subject, and title cards in the card catalog
   - uses these cards to locate fiction and nonfiction books and other materials.

   Note: among other materials are such things as games, filmstrips, films, records, photographic equipment, etc., which may be found in a well-stocked library.

8. Organization and evaluation: Makes formal outlines[10]

Objective: Given selections written at his instructional level of difficulty, the child

- selects the major topics
- groups the subtopics as in a formal outline.

TABLE 1

DESIGN LEVEL AND MEAN NUMBER OF
DESIGN SKILLS FOR GRADES 1-6 IN SCHOOL X

GRADE

	1			2			3			4			5			6		
	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain
Mean Number Design Skills[1]	.98	6.6	5.6	5.4	9.5	4.1	10.5	15.1	4.6	17.8	26.7	8.9	22.3	30.0	6.7	39.4	57.7	18.3
Design Level[2]	A	B		B	B		B	C		C	D		D	E		F	G	

[1]Design Skills by Level:

1 - 3 = A
4 - 7 = B
8 - 18 = C
19 - 32 = D
33 - 49 = E
50 - 61 = F
62 - 71 = G

[2]Design Levels and Traditional Grade Levels:

A=Kindergarten
B=Grade 1
C=Grade 2
D=Grade 3
E=Grade 4
F=Grade 5
G=Grade 6

TABLE 1A

STUDENTS' BEGINNING AND ENDING INSTRUCTIONAL
LEVELS FOR SCHOOL X

		LEVELS							Total
		A	B	C	D	E	F	G	Students
Grade*	1	43**	10	0					
		3***	24	26					53
	2	6	23	9					
		0	5	33					38
	3	5	6	35	4	0			
		0	0	38	11	1			50
	4	0	1	17	26	0	0		
		0	0	15	15	10	4		44
	5	0	1	12	23	9	0		
		0	1	6	22	14	2		45

* Missing data for Grade 6
** Spring 1974
*** Spring 1975

TABLE 2

DESIGN LEVEL AND MEAN NUMBER OF DESIGN SKILLS FOR GRADES 1-6 IN SCHOOL Y

GRADE

	1			2			3			4			5			6		
	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain	1974	1975	Gain
Mean Number Design Skills[1]	1.1	6.9	5.9	8.9	13.0	4.1	13.1	22.1	9.1	23.3	29.7	6.3	34.1	39.9	5.7	43.4	46.1	2.7
Design Level[2]	A	B		B	C		C	C		C	D		D	D		E	E	

[1] Design Skills by Level:

1 - 3 = A
4 - 7 = B
8 - 18 = C
19 - 32 = D
33 - 49 = E
50 - 61 = F
62 - 71 = G

[2] Design Levels and Traditional Grade Levels:

A=Kindergarten
B=Grade 1
C=Grade 2
D=Grade 3
E=Grade 4
F=Grade 5

TABLE 2A

STUDENTS' BEGINNING AND ENDING INSTRUCTIONAL LEVELS FOR SCHOOL Y

		LEVELS							Total Students
		A	B	C	D	E	F	G	
Grade	1	46*	2	3					
		0	3**	48					51
	2		5	27	0				
			0	30	2				32
	3		3	33	9	0			
			0	12	26	7			45
	4			12	39	7			
				5	30	23			58
	5			1	8	33	2		
				0	7	33	4		44
	6			3	7	15	24	2	
				1	7	17	24	2	51

* Spring 1974
** Spring 1975

TABLE 3

CORRELATIONS BETWEEN DESIGN SKILLS
IN 1974 AND 1975 AND OVERALL GAIN IN SCHOOL X

Grade 1

	1974	1975	Gain
1974	—		
1975	.43	—	
Gain	-.10	.86	—

Grade 2

1974	—		
1975	.72	—	
Gain	-.23	.52	—

Grade 3

1974	—		
1975	.89	—	
Gain	.23	.65	—

Grade 4

	1974	1975	Gain
1974	—		
1975	.80	—	
Gain	.47	.91	—

Grade 5

1974	—		
1975	.92	—	
Gain	.25	.61	—

Grade 6

1974	—		
1975	.71	—	
Gain	-.80	-.14	—

TABLE 4

CORRELATIONS BETWEEN DESIGN SKILLS
IN 1974 AND 1975 AND OVERALL GAIN IN SCHOOL Y

Grade 1

	1974	1975	Gain
1974	—		
1975	.14	—	
Gain	-.99	-.02	—

Grade 2

1974	—		
1975	.64	—	
Gain	-.59	.24	—

Grade 3

1974	—		
1975	.74	—	
Gain	-.01	.66	—

Grade 4

	1974	1975	Gain
1974	—		
1975	.90	—	
Gain	-.08	.36	—

Grade 5

1974	—		
1975	.94	—	
Gain	-.28	.06	—

Grade 6

1974	—		
1975	.98	—	
Gain	-.22	-.07	—

TABLE 3A

GRADE 4 STUDENTS' BEGINNING SKILLS
(1974) AND AMOUNT OF GAIN IN SCHOOL X

Gain (in Skills)	Students' Beginning Number of Skills																				
	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	1*	1					1														
2			2	1		1		1	1												
3		1		1		1											1				
4	1			1			1									2		1			
5															3	2	1	2			
6									1												
7																			1		
8							2														
11																			1		
13																			1		
15														1							1
17															1						
19														1							
21																1	1				
24														1							
27																2					
28																1					

*Numbers of Students

TABLE 5

MEAN ITBS* GRADE EQUIVALENT SCORES FOR SCHOOL X
STUDENTS IN SCHOOL SPRING 1974 THROUGH SPRING 1975

Group Tested (Grade during 1974-75 school year)	Level		1974 W-1*	1974 W-2*	1974 W-3*	Level			1975 W-1	1975 W-2	1975 W-3
Grade 3 N = 47			No Tests**			9	Expect (3.9)		4.45	4.31	4.18
		Expect									
Grade 4 N = 44	9	(3.9)	4.33	4.26	4.08	10	(4.9)		5.63	5.80	5.35
								Gain	1.30	1.54	1.27
Grade 5 N = 44	10	(4.9)	4.89	4.70	4.60	11	(5.9)		6.24	5.84	5.90
								Gain	1.35	1.14	1.30
Grade 6 N = 68	11	(5.9)	6.24	5.90	5.86	12	(6.9)		7.84	7.65	7.24
								Gain	1.60	1.75	1.38

*Iowa Tests of Basic Skills: W-1, Map Reading; W-2, Reading Graphs and Tables; W-3, Knowledge and Use of Reference Materials.

**ITBS Subtests W-1, W-2, W-3 are not available for Kindergarten, Grade 1 or Grade 2.

TABLE 6

MEAN ITBS* GRADE EQUIVALENT SCORES FOR SCHOOL Y
STUDENTS IN SCHOOL SPRING 1974 THROUGH SPRING 1975

Group Tested (Grade during 1974-75 school year)	Level		1974 W-1*	1974 W-2*	1974 W-3*	Level			1975 W-1	1975 W-2	1975 W-3
Grade 3 N = 45			No Tests**			9	Expect (3.9)		4.28	4.25	4.26
		Expect									
Grade 4 N = 58	9	(3.9)	4.47	4.32	4.16	10	(4.9)		5.29	5.44	5.31
								Gain	.82	1.12	1.15
Grade 5 N = 44	10	(4.9)	5.41	5.43	5.29	11	(5.9)		5.90	6.12	6.26
								Gain	.49	.69	.97
Grade 6 N = 51	11	(5.9)	6.01	6.07	6.19	12	(6.9)		7.18	7.03	7.43
								Gain	1.17	.96	1.24

*Iowa Tests of Basic Skills: W-1, Map Reading; W-2, Reading Graphs and Tables; W-3, Knowledge and Use of Reference Materials.

**ITBS Subtests W-1, W-2, W-3 are not available for Kindergarten, Grade 1 or Grade 2.

TABLE 7

GENERAL CORRESPONDENCE BETWEEN*
ITBS SUBTESTS W-1, W-2, and W-3
AND WISCONSIN DESIGN INSTRUCTIONAL LEVELS FOR
GRADES 3**-6 IN SCHOOL X

GRADE	Spring 1974				Spring 1975			
	ITBS Mean Grade Equivalent Scores			Design Instructional Level	ITBS Mean Grade Equivalent Scores			Design Instructional Level
	W-1	W-2	W-3		W-1	W-2	W-3	
3					4.45	4.31	4.18	C
4	4.33	4.26	4.08	C	5.63	5.80	5.35	D
5	4.89	4.70	4.60	C	6.24	5.84	5.90	D
6	6.24	5.90	5.86	E	7.84	7.65	7.24	F

*Iowa Tests of Basic Skills: W-1, Map Reading; W-2, Reading Graphs and Tables; W-3, Knowledge and Use of Reference Materials.

**ITBS Study Skills Subtests are not available for students in kindergarten, first or second grades.

TABLE 8

GENERAL CORRESPONDENCE BETWEEN*
ITBS SUBTESTS W-1, W-2, and W-3
AND WISCONSIN DESIGN INSTRUCTIONAL LEVELS FOR
GRADES 3**-6 IN SCHOOL Y

GRADE	Spring 1974				Spring 1975			
	ITBS Mean Grade Equivalent Scores			Design Instructional Level	ITBS Mean Grade Equivalent Scores			Design Instructional Level
	W-1	W-2	W-3		W-1	W-2	W-3	
3					4.28	4.25	4.26	C
4	4.47	4.32	4.16	C	5.29	5.44	5.31	D
5	5.41	5.43	5.29	D	5.90	6.12	6.26	D
6	6.01	6.07	6.19	E	7.18	7.03	7.43	E

*Iowa Tests of Basic Skills: W-1, Map Reading; W-2, Reading Graphs and Tables; W-3, Knowledge and Use of Reference Materials.

**ITBS Study Skills Subtests are not available for students in kindergarten, first or second grades.

TABLE 9

SKILL GROUPS FORMED IN DESIGN STUDY SKILLS SUBAREAS
IN SCHOOLS X AND Y DURING ONE YEAR

Level	Skills in Subareas M, G, R	SKILL GROUPS FORMED			Total
		Maps	Graphs & Tables	References	
A	(3, 0, 0)	5*	-	-	5
		4**	-	-	4
B	(3, 1, 0)	7	4	-	11
		10	2	-	12
C	(5, 4, 2)	8	11	1	20
		14	8	1	23
D	(3, 3, 8)	12	9	12	33
		5	8	17	30
E	(3, 4,10)	17	32	21	70
		5	4	6	15
F	(4, 2, 6)	13	14	17	44
		4	1	2	7
G	(4, 3, 3)	0	9	14	23
		0	1	0	1
T O T A L (71)		62	79	65	206
		42	24	26	92

* School X

** School Y

TABLE 10

AVERAGE SKILL GROUP SIZE AND
MASTERY RATE FOR SCHOOLS X AND Y

GRADE	SCHOOL X		SCHOOL Y	
	Average Group Size	Average Number of Masters	Average Group Size	Average Number of Masters
1	11.6	6.3	17.6	15.6
2	8.4	4.5	11.4	8.1
3	9.6	2.9	13.3	6.7
4	8.6	2.3	9.1	3.4
5	10.8	2.4	7.8	2.0
6	13.8	3.7	9.5	3.0

TABLE 11

LENGTH OF SKILL GROUP INSTRUCTION
IN SCHOOLS X AND Y

Skill Group Meetings (Over 3-Week Period)	% of Groups in School X	% of Groups in School Y
1-3	13	23
4-6	32	57
7-9	23	8
10-13	22	8
14-18	10	4
Length of Sessions (minutes)		
5	0	2
15-20	6	54
25-30	39	36
40-45	55	8

TABLE 12

GROUPS FORMED FOR TEACHING INDIVIDUAL SKILLS*
IN SCHOOLS X AND Y DURING ONE YEAR

Level	(Total Number Skills)	Many Groups in Both Schools[1]	Many Groups in School X[2]	Many Groups in School Y[3]	Few Groups in Either School[4]	Few or No Groups In Either School[5]
A	(3)	2*[7]**				1,3
B	(4)	3[8]	4	1	2	
C	(11)	1[8],6[9]	7	5	3,4	2,8,9,10, 11
D	(14)	3[7],4[7], 6[8],9[8], 12[7]	1		7,10,11	2,5,8,13, 14
E	(17)	1[10]	2-7,9,10, 13,15		8,12	11,14,16, 17
F	(12)		1,5,6,7, 11,12		2,9	3,4,8,10
G	(10)		5,8.10		7	1-4,6.9
TOTAL	(71)					

* Skills are listed by number on profile card. Consult the profile card for names of skills.

** Number in brackets is actual number of skill groups formed (across both schools) to teach that skill, e.g., seven skill groups were formed between School X and School Y to teach Skill 2 at Level A.

[1] Three or more skill groups were formed in each school.

[2] Three or more skill groups were formed in School X, and none or one group formed in School Y.

[3] Three or more skill groups were formed in School Y, and none or one group formed in School X.

[4] From one to three skill groups were formed in each school.

[5] No skill groups were formed in one school and only one or two groups were formed in the other school.

FIGURE 1

STUDY SKILLS SUBAREAS AND STRANDS

MAPS	GRAPHS & TABLES	REFERENCES
Representation	Comparing	Utilization
Orientation	Extracting	Location
Measurement	Differences	Organization and Evaluation
	Purpose	
	Summary	
	Projecting and Relating	

FIGURE 2 PROFILE CARD

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

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LEVEL A:

- R — PT — Representation
- O — Positions of objects
- M — Measurement: size

All A skills

LEVEL B:

- R — Picture symbols
- O — Picture grids
- M — Measurement: distance
- G — Graphs: relative amounts

All B skills

LEVEL C:

- R — Nonpictorial symbols
- O — Color keys
- M — Number-letter grids
- M — Measurement: size
- M — Measurement: distance
- G — Graphs: exact amounts
- G — Graphs: differences
- T — Tables: relative amounts
- T — Tables: one cell
- U — PT — Book skills
- U — Alphabetizing

All C skills

T37709X

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

PUPIL NAME _____ DATE _____

UNIT _____ GRADE _____ SPECIAL CODE _____ LEVEL _____

SKILL	RS	M	%C

KEY TO STRANDS

Maps	Graphs and Tables	References
R — Representation	G — Graphs	U — Utilization
O — Orientation	T — Tables	L — Location
M Measurement		OE — Organization & Evaluation

NOTE: Skills marked PT are assessed by a performance test.

LEVEL D:

- R — Point & line symbols
- O — PT — Cardinal directions
- M — Scale: whole units
- G — Graphs: differences
- G — Graphs: approximate amounts
- T — Tables: differences
- U — Indexes
- U — PT — Dictionaries & glossaries
- U — Tables of contents
- L — Alphabetizing
- L — Guide words
- OE — Headings & subheadings
- OE — Selecting sources
- OE — Facts or opinions

All D skills

LEVEL E:

- R — Point, line, & area symbols
- O — Intermediate directions
- M — Scale: multiple whole units
- G — Graphs: differences
- G — Graphs: purpose & summary
- T — Tables: mult. differences
- T — Tables: purpose & summary
- U — Indexes
- U — Dictionary meanings
- U — Cross references
- U — PT — Varied sources
- L — Guide words
- L — Guide cards
- OE — PT — Notetaking
- OE — Specialized references
- OE — PT — Books: special features
- OE — Fact checking

All E skills

63

STUDY SKILLS

LEVEL F:

- R — Maps: analysis
- O — Map projections
- M — Inset maps
- M — Different scales
- G — Graphs: differences
- T — Schedules: relationships
- U — Subject index
- U — Dictionary pronunciation
- L — Card filing rules
- L — Dewey Decimal System
- OE — Outlining
- OE — Catalog cards

All F skills

LEVEL G:

- R — Maps: synthesis
- O — Latitude & longitude
- M — Meridians & parallels
- M — Scale: fractional units
- G — Graphs: mult. differences
- G — Graphs: projecting & rotating
- T — Schedules: problem-solving
- U — Reader's Guide
- U — Card catalogs
- OE — Outlining

All G skills

DATE	NO. OF SKILLS	GROWTH

FIGURE 3

SKILL GROUP CARD

PLEASE FILL OUT ONE OF THESE CARDS FOR EACH SKILL GROUP YOU FORM

SKILL #(s) _____

Skill name(s) _____

No. pupils
in group _____ in grade _____
_____ in grade _____

No. masters_____ in grade _____
_____ in grade _____

Dates taught:
began _____
ended _____

Meeting time:
_____ hour(s) day for
_____ day(s) week for
_____ week(s)

SCHOOL _____

TEACHER _____

Materials used to teach skills:
Indicate N (never), S (some),
A (a lot)

TRF: SS _____
self-made _____
audio-visual _____
text (specify) _____
other (specify)_____

Was this skill group combined with any other group during instruction?

PLEASE MAKE COMMENTS ON REVERSE SIDE Yes _____ No _____